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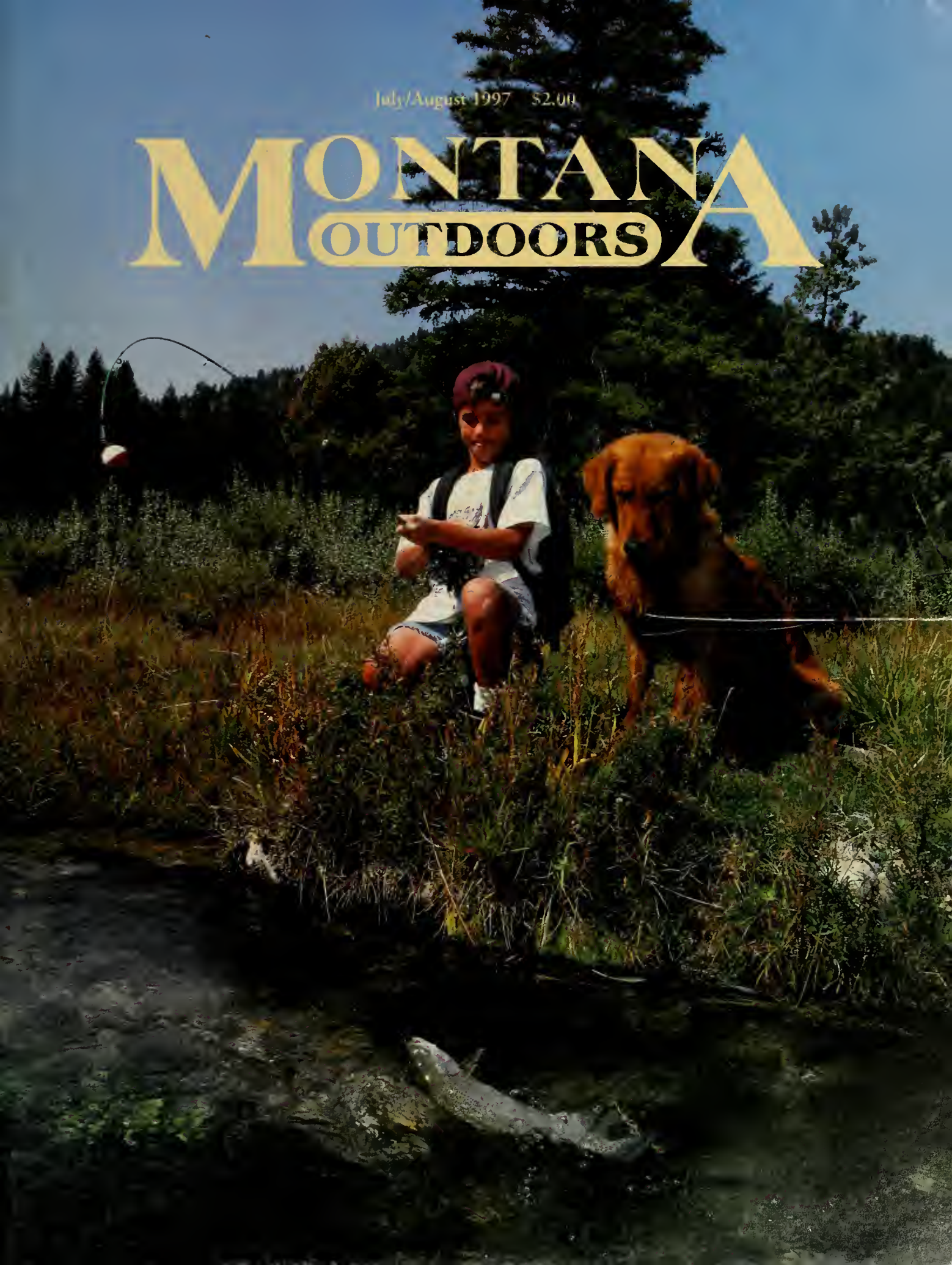
MONTANA OUTDOORS



Our Point of View

Faced with diminished public access to the resources we manage, whirling disease, declining mule deer populations, loss of habitat, and conflicts between user groups, it has become perfectly clear—we cannot meet these challenges alone. Our 1996 Annual Report chronicles our response to these issues and more.

DONALD M JONES

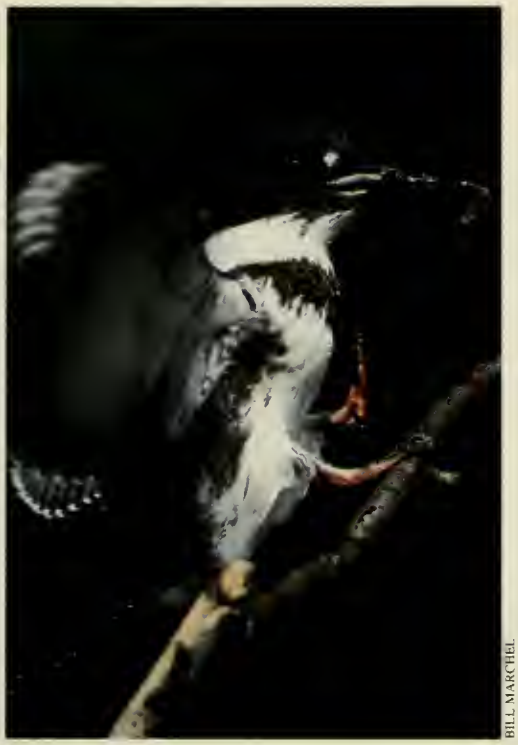
An array of partnerships with Montana citizens has moved us forward. The Private Land/Public Wildlife Council provided a pathway to nearly tripling the number of landowners in FWP's Block Management hunting access program in a single year. Montana's Whirling Disease Task Force provided the leadership in developing an action plan that attracted national research dollars and a new research facility to Montana to combat this threat. The Ruby River Task Force developed a first-of-a-kind fishing access plan for that southwestern Montana waterway. Watershed groups are being formed to conserve threatened fish species.

Citizens' groups likewise addressed statewide and local issues from Kalispell to Glasgow, from elk to snowmobiles. And Montana's citizen Fish, Wildlife & Parks Commission, in recognition of its exemplary service to all Montanans, was presented the "Commission of the Year" award by the Western Association of Fish and Wildlife Agencies for the first time in the Commission's 100-year history.

The citizens on these groups are not simply this agency's customers, they are our partners in fish, wildlife and parks. They are part of the Montana community. They embody the Montana way of life we are so desperately trying to maintain.

They give us hope.

Patrick J. Graham, Director
Montana Fish, Wildlife & Parks



BILL MARCHEL

Kingfishers eat a variety of prey, but their main diet is small fish (page 10).

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The War on Whir

Dispatches from the front

DUSAN SMETANA

by Tom Palmer

It is the most distressing fish malady in modern conservation history: whirling disease and the sudden collapse of rainbow trout populations in some of the most storied wild trout fisheries in the Rocky Mountains. The epicenter of the whirling disease crisis is surely Montana's Madison River, where the odd disease was identified in 1994. Since then, scientists from around the world have brought their training to bear on *Myxobolus cerebralis*, the wee, unfathomably complicated parasite responsible for looting our trout waters.

Researchers quickly established that trout are being triangulated by the parasite, a worm, and the environment. Much of the current scientific work is focusing on the possibility of circumventing any of the triangulation points to give trout a chance to survive in our brightest rivers.

"We're dealing with a clever little parasite," Ron Hedrick told *Montana Outdoors* from his research lab at the University of California at Davis. Hedrick, a professor in the Department of Veterinary Medicine and Epidemiology, is among the nation's elite fish-disease researchers. "It's doing a lot of things we didn't think it could do," he said, "and it's not doing some of the things we thought it could. I guess we all feel as if we're picking away at it little by little and in that way acquiring a better idea of how to get at it. It's a slow process. There's no silver bullets and no quick fixes."

What follows is a small sample of a rapidly changing story about the extraordinary work being done to help save an international treasure: Montana's wild trout fisheries.

LING DISEASE

Microscopic spores are found on the river bottom.
Bottom-dwelling tubifex worms eat the spores.
Inside the tubifex worm, the spore changes form and becomes a Triactinomyxon (TAM
What in the Whirld is Whirling Disease?
People are saddened when they learn that whirling disease has been found in their favorite river. However, everyone is hopeful that a solution will be found.
The TAM's are released from the tubifex worm and into the water.
After several weeks, infected fish may exhibit a "whirling" behavior, spinal deformities and black tails.
Once inside the fish, the TAM changes form again and moves into the fish's cartilage near the head where it develops into a mature spore.
When the infected fish dies or is eaten by a predator, the spores in its body are released into the water and the cycle starts over.
Trout become infected when the tiny TAM's cling to the fish's body and work their way into the fish's nervous system.
For more information contact: Montana Fish, Wildlife & Parks • 1420 E. 6th Ave. • Helena, MT • 59620

Illustration by Randy Bright

The Whirling Disease Life Cycle

As a refresher, recall that the onset of whirling disease is caused by a virulent sporoplasm—a primitive life form that invades a trout's body through the skin. This multi-celled creature travels via the nerves where it can't be impeded by immune system antibodies. Eventually the parasite settles in to digest the fish's cartilage, especially cartilage in the head of recently hatched trout, and there begins to inflict the serious physical damage that has devastated some trout populations.

When the remnant cartilage hardens into bone, the infectious parasites become trapped, dormant spores. The profuse *M. cerebralis* spores reenter the environment when an infected fish dies and decomposes. These liberated spores pepper the streambed where they are eaten by the thread-thin aquatic worm scientists know as *Tubifex tubifex*. Within the gut of an infected worm, *M. cerebralis* hatches, releasing from the spore a new generation of the parasite into the cells of the worm's intestines. Eventually that creature morphs into a fragile, willowy, three-armed beast the worm spews from its gut by the hundreds. These transformed organisms—Triactinomyxons or TAMs—are often compared to minuscule grappling hooks that can erupt from the streambed in a "blizzard" to be swept downstream where they have about six hours to latch onto a trout. Once grappled to a fish, each TAM can inject up to 64 "packages" of the virulent sporoplasms into the fish to begin the life cycle anew.

The Parasite

Two years ago, scientists weren't sure what to make of the parasite that toppled wild rainbow trout populations on the upper Madison River. Since the discovery of whirling disease in Montana, international research has resulted in several intriguing discoveries, but *M. cerebralis* remains a scientific bugbear. "Every step of the way we keep finding out how

clever this thing is," said Beth MacConnell, the U.S. Fish and Wildlife Service's top whirling disease researcher at the Fish Technology Center in Bozeman.

One day recently, MacConnell tried to kill a batch of the microscopic spores by dropping them into a test-tube bath of hydrogen peroxide. The chemical was diluted to 25,000 parts per million, a solution still more than 10 times as strong as the common drug store variety that can readily oxidize human skin cells. In no time the chemical reaction blew the corks off the test tubes, and for the balance of the 10-minute experiment the glass tubes, tipped, tinkled, and clinked in proper Gothic fashion. In the end, half of the spores survived. "That's one tough little spore," MacConnell grumbled.

About 750 miles west of Bozeman, researchers at the University of California at Davis are collecting *M. cerebralis* spores for various experiments. So far, Ron Hedrick's team has confirmed that trout once sufficiently infected with whirling disease seem to develop an "immunity" to subsequent attacks. In tightly controlled tests, trout exposed to fewer than 200 TAMs, for instance, did not manifest any disease symptoms, but neither could they defend themselves against higher-dose attacks some weeks later. Meanwhile, trout exposed to 1,000 or more TAMs did contract whirling disease, but they could miraculously rout subsequent TAM attacks. The gist of this quick-response resistance to reinfection is unknown, but further tests could reveal that the antibodies that emerge in the skin of previously infected trout may have a role in protecting them from more potent attacks in the wild.

A new tool perfected for whirling disease detection by the UC-Davis researchers, the Polymerase Chain Reaction, or PCR, will come in handy for this and other diagnostic tests. The significance of the PCR lies in its ability to scan and amplify the genetic material of any of the closely related parasites in *M. cerebralis*' crammed family tree. It can be used at any stage in the parasite's complex life cycle to cut through the chaff and immediately isolate the whirling disease desperado. Imagine opening any *Where's Waldo?* book to any page and always immediately spotting scrawny Waldo in any of the chaotic tableaux. Now imagine possessing the acumen to see Waldo even in the smallest scribble in a dumpster full of shredded *Where's Waldo?* books and you begin to get an idea of the PCR's diagnostic authority. The PCR is so powerfully sensitive it can detect *M. cerebralis* as a TAM drifting in a stream, or stowed in the gut of an infected worm.

US FISH & WILDLIFE SERVICE

Beth MacConnell checks on a whirling disease experiment at Blaine Spring Creek, a tributary of the Madison River.

Hedrick's team also has discovered that TAMs will attack almost any fish, but so far only trout seem unable to ward off disease. "Somehow the parasite isn't recognized in the early stages by the trout," Hedrick said. "The initial armor isn't working and trout aren't responding as well as we would hope."

Guppies, for one, can gather the tools in their skin to quickly smother and seemingly consume the TAMs' sporoplasm injections. Even in severe attacks of 2,000 TAMs per fish, guppies emerged unscathed where trout were eventually wasted. Hedrick has also found that TAMs will not squander their sporoplasm on a dead trout. TAMs scorn even freshly killed trout, leading researchers to think the fluttering fins and gills act as derricks to pull the sporoplasms from the TAM.

Because the epidemic problems associated with some wild trout populations in Colorado, Montana, and Utah have not been experienced in wild trout populations on the East and West coasts, where *M. cerebralis* has a longer history, nor in Europe where it has an even longer history, international researchers have wondered if the recent intermountain phenomena

The Worm

Tubifex tubifex, the thread-thin, burnt-red, blind, bottom-dwelling aquatic "sludge" worm, is a critical host in the whirling disease life cycle. It is not the cause of whirling disease any more than a trout is. The worms, like trout, are alternate hosts of the whirling disease parasite.

Because the severity of infection within a stream's trout population could well depend on the abundance and distribution of tubifex worms, researchers are mapping the distribution and abundance of *T. tubifex* in Montana's waterways.

One of the scientists, Montana State University's Dan Gustafson, has collected worms from more than 360 sites. His work suggests the worm is found in springs and spring creeks, the transition zone between the mountain and prairie, and in degraded stream habitats such as below dams, in irrigation canals, and in areas generally affected by pesticides, sedimentation, nutrient and organic enrichment, or any other factor that lowers the diversity of aquatic plants and insects.

Headwater streams in national parks, wilderness areas, and other undisturbed areas have generally proven to be tubifex-free. Yet, there are several major lowland rivers where the worm either hasn't been found or is found in very low densities; these include the Bitterroot, Yellowstone above Livingston, Yaak, St. Mary's, Clearwater, Blackfoot, and Gallatin.

Based on tubifex abundance, high-risk whirling disease waters include the Madison, Jefferson, Beaverhead, Missouri, Bighorn, East Gallatin, Ruby, and Red Rock rivers, and most spring creeks. Whirling disease has been detected in all of these except the Bighorn and East Gallatin.

RON HEDRICK

Tubifex worms, shown here magnified many times, are present in several of Montana's premier trout waters.

"Every additional day of survival offers a trout more resistance to the disease."

represent a different strain of *M. cerebralis*. Some have even theorized that *M. cerebralis* has always been in the Rocky Mountains, an idea that Hedrick's team quashed once and for all.

In cooperation with researchers in Budapest, Hungary, UC-Davis researchers set out to determine if an *M. cerebralis* species already existed on this continent before the 1950s, when it is thought to have arrived from Europe in a shipment of frozen "table" trout. If a similar species from a common *M. cerebralis* ancestor existed simultaneously in Europe and North America, researchers would expect to see a reasonable amount of genetic variation in the two parasites. Upon examination they found the telltale genetic sequences of *M. cerebralis* from both sides of the Atlantic Ocean to be nearly identical, which confirmed for Hedrick that the bug infecting trout on this continent is a "a recent introduction to North America, but this one could be more pathogenic." In other words, the *M. cerebralis* in the Rocky Mountains is the same as *M. cerebralis* in Europe, New York, and California, but ours could well have rapidly evolved into a more virulent strain than its far-flung brethren.

The Fish

Trout are dreamy creatures, but the don of wild trout management in Montana is a realist. Dick Vincent has been standing chest deep in coldwater rivers for more days than he'd like to count. More than 30 years have flowed by and for many of them he's walked against the current. Now, in his new role as FWP's whirling disease coordinator, he's inclined to dash the holdout hope of finding a genetic supertrout immune to whirling disease as a dream that won't come true. "As best as we can tell," he said, "there is no bulletproof rainbow trout in North America nor is there a bulletproof cutthroat trout."

Over the past two years, more than 20,000 wild fish have been scooped from Montana waters and put under the microscope. Species found to be hosting the whirling disease bug

include brook trout, brown trout, cutthroat trout, kokanee salmon, mountain whitefish, rainbow trout, and rainbow/cutthroat trout hybrids.

In Montana's controlled field experiments, clinical susceptibility has been well established in native Yellowstone and westslope cutthroat trout and in three strains of exotic rainbows, including the Deschutes rainbow, an Oregon native once surmised to be armored against fatal whirling disease infection. Only the Arctic grayling, Montana's heroic native trout displaced and squeezed into ever narrower quarters, has shown a clear ability to resist whirling disease. Montana's other troubled native trout is not so lucky. Researchers at UC-Davis have shown bull trout to be prone to infection.

While whirling disease is present in the Missouri River below Holter Dam, rainbow numbers have not declined as they have in the Madison.

E. NEALE STREEKS

If Vincent is philosophically resigned to the belief that trout are not bulletproof, he has high hopes that fish may be able to dodge a fatal hit. "We know big fish are better off than little fish," he said. "Every additional day of survival offers a trout more resistance to the disease."

In a temperature-controlled environment, UC-Davis scientists have shown that a trout's most vulnerable days may be numbers one through 44. The cartilage whirling disease parasites are on a mission to consume begins to mineralize—or harden into bone—about 30 days after hatching. By the 44th day the bone is well hardened, leading Vincent and others to theorize that if newly hatched trout fry can avoid the bug for their initial month of existence, chances for survival may increase dramatically and continue to increase with each additional day.

As it turns out, for Vincent the solution to whirling disease may come more easily if managers yield to it. Instead of confronting the disease directly with trout that are essentially TAM pincushions incapable of weathering the subaqueous blizzard, Vincent sees more hope in simply circumventing infection by putting a trout's natural life history to work to keep them out of the most blustery TAM eruptions.

Beth MacConnell, at the federal Fish Technology Center, has similar ideas that the parasite's activity may be keyed to a particular time of year and a specific range of water temperatures that trigger the worms to expel their TAMs. "There does seems to be a seasonality to the parasite and if that's the case," MacConnell commented, "do rainbows get hit with a wallop dose and can that wallop dose be somehow avoided?"

FWP PHOTO

Dick Vincent, FWP's whirling disease coordinator.

Vincent thinks trout that spawn early in spring—in March and April—may have a survival advantage over those that spawn in late spring and early summer. For two seasons he has collected data at his elaborate PVC pipe and water tank research station at Willow Creek, the once-vital rainbow trout spawning run now beset with whirling disease. His work suggests that temperatures below 45 degrees Fahrenheit are inhospitable to whirling disease and the onslaught of TAMs because the devastating blows to young fish have not been delivered until late May, when the water warms to about 56 degrees.

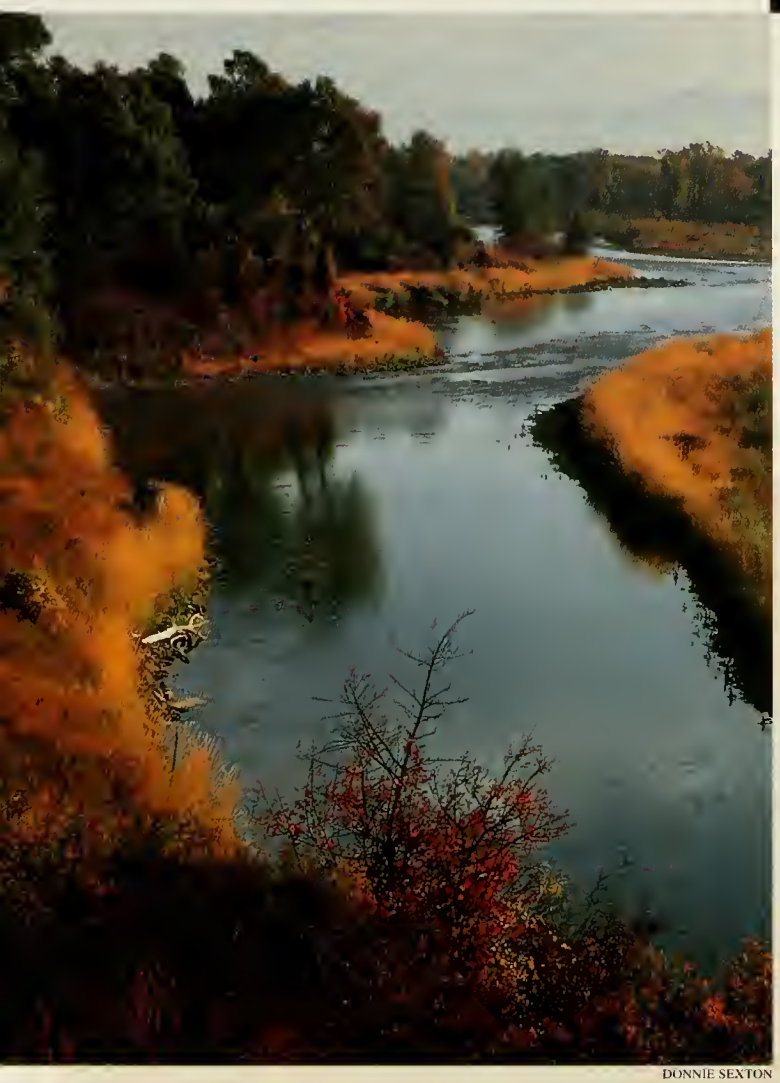
As usual, Vincent has a theory about what's happening. He reasons that if the fish spawn and hatch at least a month before the peak release of TAMs, the fry may survive for critical weeks in a chilly sanctuary not to the parasite's liking. Each day of survival 30 days past hatching could allow unimpeded bone development and the ability for trout fry to better armor themselves against fatal whirling disease infections. "Fall spawners would have the best advantage, but there are no fall-spawning rainbow," Vincent said. "The hard part will be matching a rainbow trout to the right time of year. Is there a rainbow trout that will work within this seasonal realm?"

This summer Vincent hopes to answer his own question. He will create a database of all rainbow trout strains known to exist in the wilds of North America and catalog the life history of each fish. Because the rainbow is widely believed to be a malleable sport fish—some even suggest that today's wild rainbows are domestic fish gone feral—Vincent has conjured a new hope that a March-spawning rainbow will be found somewhere on the continent. "For rainbow trout, it's going to be spawn early or die," Vincent said ruefully.

Brown trout may be Montana's only fall-spawning trout, but there are interesting reports from the Madison River heralding a

AL TROTH

Above: *Rainbow trout are highly susceptible to whirling disease, but also genetically "malleable." Researchers are currently in search of a wild strain that spawns early enough to avoid infection.*



DONNIE SEXTON

Left: *The Jefferson River, with 11 whirling disease-positive sites, is one of Montana's more heavily infected drainages.*

The Waters

Fish from 209 rivers and streams; 3 springs; and 49 lakes, reservoirs, and ponds have been probed for whirling disease. Fifty-eight individual sites on 44 waters—about 20% of all sample sites—have been found to be holding fish with varying degrees of whirling disease infection.

The disease seems to have a preference for rivers and streams. Fifty-one of the 58 positive sites are on rivers or streams; 8 are on lakes, reservoirs or ponds; and 1 is on a spring.

Montana's 9 state, 3 federal, and 10 private hatcheries are not now infected with whirling disease, nor have they ever been infected.

Montana is generally defined by 22 major river drainages.

population blip for yearling rainbow trout whose numbers rose considerably last fall. While this is an encouraging sign that some young rainbow trout have survived, Vincent doesn't believe the fish have acquired an immunity to whirling disease. "We're thinking that these fish have somehow avoided infection," he stressed. "It may be related to water temperature, or perhaps these fish spawned in a place where the whirling disease parasite was not active. We don't know."

No matter how one looks at them, the numbers are a welcome change from previous years. There is a significant increase in the population of five- to eight-inch rainbow trout, producing an age class whose numbers are climbing toward levels once considered "low-end." In retrospect, this statistically weak age class appears especially hale and hearty in the early years of the sad era of whirling disease.

If Vincent's spawn-early-or-die theory is on target, Montana's spring- and summer-spawning cutthroat trout probably reproduce at the most inopportune time. But if the objective is to avoid whirling disease parasites, cutthroat trout may have developed a winning life history. So far, of 1,639 wild cutthroat examined in Montana, only one was found to have been exposed to whirling disease. Cutthroat trout tend to spawn in cold mountain streams that appear not to have been invaded by the worms responsible for the plentiful spewing of the grappling-hook TAMs. More circumstantial evidence of the cutthroat's lucky life history comes from the Madison River, where biologists are already picking up increased numbers of catchable cutthroat trout—healthy fish likely recruited from mountain streams. Electrofishing data collected from the three-mile-long Pine Butte section on the upper river showed a count of about 40 catchable cutthroats in 1996, where fewer than six were counted prior to 1991.

Throughout Montana's most beloved trout-producing river drainages there exist many tributaries that may provide some precisely timed protection for trout on the run from whirling disease. Vincent hopes to somehow recruit rainbow trout to use those tributaries to spawn and rear young. "We see fish all the time that are not infected," Vincent said. "We know they're not immune to whirling disease, we know whirling disease has infected the same age-class fish in the same system, so we need to think about helping fish avoid infection. Right now, the best hope for the future of wild trout may be the tributaries, if we can in fact keep them disease-free." ■

Infected fish have been confirmed in eight of them: the Beaverhead; Big Hole; Blackfoot; Clark Fork above the Bitterroot River; Flathead below the South Fork; Jefferson; Madison; and Missouri above the Marias River.

River drainages with the most infected individual waters are: the Beaverhead with 18 positive sites; Clark Fork above the Bitterroot with 12 positive sites; Jefferson with 11 positive sites; and Madison with 9 positive sites. Other infected drainages have one or two whirling disease-positive sites.

Within some of these drainages are small tributaries where only 5% of the fish are infected. "We're finding that you need 30% to 40% of fish to be infected to get population declines," says Dick Vincent, FWP's whirling disease coordinator.

Drainages that have not relinquished infected fish include: the Bitterroot; Clark Fork below the Bitterroot; Flathead above the South Fork; Gallatin; Kootenai; Marias; Milk; Missouri below the Marias; Musselshell; St. Mary's; Sun; and Yellowstone both above and below the Bighorn.

Major waterways (as opposed to whole drainages) that are still believed to be whirling disease-free include: the Yellowstone; Bighorn; Stillwater; Boulder (of the Yellowstone); Gallatin; East Gallatin; upper Missouri below Cascade, and the stretch from Headwaters to Canyon Ferry Reservoir; Teton; Bitterroot; Flathead; Kootenai; Marias; Big Spring Creek; and Madison above Quake Lake.

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Kingfisher in Winter © Robert Bateman

A Halcyon Dream

by Jerry Kustich

A STATELY FELLOW he was, this kingfisher, staring down into the cold waters of the Beaverhead River last December. Although annual Christmas bird counts reveal an occasional member of his species, particularly in northwestern Montana, the few birds that winter in southwestern Montana are usually found near one of the local warm springs. But this kingfisher was perched on a wire stretching over the icy river just outside of Twin Bridges, a somber soul, forlorn and resigned.

Watchable Wildlife

While the image of that bird remains etched in my senses, it was another portrayal of a kingfisher by Canadian wildlife artist Robert Bateman years ago that piqued my interest in both the kingfisher and the artistic expression of birds. Entitled "Kingfisher in Winter," the painting illustrated a mature birch cradling the serene bird, overhanging the dark waters of a winter stream accented by a shoreline of deep snow. Wildlife art can speak volumes if the artist's brush can capture the essence of its subject in that one moment in time.

Indeed, there is something special about the kingfisher. It is the favorite bird of many people, even those who aren't

BILL MARCHEL

A shaggy crest, a large, pointed bill, short legs, and small feet are prominent kingfisher traits.

avid birdwatchers. This bird enchanted the ancient Greeks and Romans as well. In fact, the Roman poet Ovid's translation of an ancient Greek love tale best explains the kingfisher's role in mythology. It seems Ceyx, the King of Thessaly, was married to Alcyone, the daughter of Aeolus, King of the Winds. When Ceyx needed to see the oracle across the sea, Alcyone begged him not to go, for she knew well the danger that lurked in the winds. So as she learned of Ceyx's shipwreck, and that he had drowned with her name on his lips, the distraught Alcyone cast herself upon the sea to forever join her lost love. But before she reached the water, she was transformed into a bird, a mythical kingfisher. The merciful gods changed Ceyx into a kingfisher as well, so they could be together forever.

From then on, the two built their nest at sea during a windless period provided by Aeolus. The seven days before the shortest day of the year was used for nest building, the seven days after for hatching the eggs. The Latin added the "h" to Alcyone, and the kingfisher in Latin poems was subsequently referred to as a halcyon (pronounced *hal see on*). Thus, the period of calm and peace associated with December came to be known as the "halcyon days" of winter. This tale must have inspired Bateman's winter kingfisher, for it is the spirit of halcyon that he has portrayed so perfectly in his work.

The kingfisher family, Alcedinidae, contains some 86 members worldwide. Most are compact birds with short necks, large heads, and a crest that erects when the bird becomes alarmed. A large, sharp-pointed bill is a family trait, as are short legs and small, weak feet. Although it is commonly assumed that all kingfishers prey on fish, some in the Old World actually live far from water. Most family members are dapper-looking birds decked out in what has traditionally been referred to in Europe as "the King's dress."

Only three species of kingfishers live in North America, and two of these occur exclusively near the Mexican border. The bird commonly seen near water throughout the U.S. is officially known as the belted kingfisher, *Ceryle alcyon*. The genus name derives from the Greek word kerylos, meaning halcyon, and the species name honors Alcyone, the daughter of Aeolus. Although it is the small, beautiful kingfisher found throughout Europe that has inspired so much of the folklore through the centuries, ironically the American species bears the names that connect the kingfisher to the mythical past.

WHEN THE WARM, still days of summer breathe a halcyon kind of peace, the lure of trout draws many of us to Montana's streams and rivers. Because the nature of dry-fly fishing is waiting, watching, and blending into the background of willow and cottonwood, we often witness a choreographed show of nature that can pleasantly distract even the most avid of anglers. In the long shadows cast by the setting sun, mayflies reflect the glint of the passing sunlight, caddis form thick clouds at the tops of trees before descending to the water, and birds feed in frenzied haste on the millions of insects a late summer evening can produce. Robins, nighthawks, flycatchers, and western tanagers all get into the act.

Downriver a great blue heron stands as still as a stick, and a mink slinks from one rock to the next. Suddenly the resident kingfisher flies by in a fuss, making a croaky kind of rattle, and perches high on a dead limb hanging over a prime section of fishing water. This solitary bird has an air of superiority,

BILL MARCHEL

STEVE CARLISLE

BILL MARCHEL

Often seen perched on a limb overhanging the water (top photo), kingfishers eat minnows, frogs, crayfish, and a variety of small prey. The male kingfisher (above left) sports a blue belt across its white chest, while the female (above right) has an additional orange band below the bluish one.

an *attitude*—it is obviously unwilling to share its water with anything or anyone. But for the bird, fishing is demanding work requiring skill and patience; it cannot afford to have its concentration broken by intruders. It is a true angler, one that would make Izaak Walton proud.

Both male and female belted kingfishers sport a shaggy crest on their bluish head, a bluish back, and the same belt of blue across their white chest. The wing feathers are decorated with white dots, and another white spot can be seen just in front of the eye. The female has a distinctive orange band on her breast below the bluish one.

Other than during courtship, it is unusual to find two kingfishers in the same area, for they are loners as well as extremely territorial, chasing away all competitors—at least of the kingfisher persuasion—to other parts of the river. There's a lot of water, these birds figure, no need to crowd.

Although kingfishers eat a wide array of small prey, including frogs, lizards, crayfish, toads, grasshoppers, mussels, snakes, and insects, their main diet is small fish. They can often be seen perching on an overhang-

ing branch or hovering as much as 40 feet above the water, using their sharp eyes to seek out a meal. When a kingfisher spots a minnow, it dives headlong into the water, sometimes submerging completely, then resurfaces with its victim gripped in its bill or occasionally speared. After flying back to its perch, the kingfisher beats the fish on a limb and tosses it up in the air before catching and swallowing it head first. Later, pellets are disgorged containing fish bones, scales, and other indigestible items.

This cunning and skill is not without cost or effort, a point driven home as I stalked the Big Hole River last summer for rising fish. As I moved quietly along, my tranquillity was disturbed by a *kerplunk* somewhere behind me. It was the sound a rock might make if casually tossed from a high bridge. A few minutes later I heard another *kerplunk*, and turned in time to see a kingfisher struggling out of the water and flying back, empty billed, to a low-hanging limb. As I watched, the bird again dove from the branch, again with the same result.

For we humans, becoming a good fisher takes much practice. But for this bird, it was a matter of survival—no "catch and release" here. From what I could see, dinner would be pretty slim pickings until this determined fellow mastered his craft.

Members of the family Alcedinidae use their feet and bills to excavate nesting burrows in clay or sand banks. The belted kingfisher usually builds a horizontal or upturned shaft of three to seven feet with a distinct nesting chamber at the end. Both the male and female take part in the digging, and sometimes the process takes weeks. Although the burrow is often built along the shore, some have been found far from water. The mouth of the tunnel is frequently hidden near a root wad, under a protruding rock, or in a similar safe location. Once the five to eight eggs are laid, it takes at least seven weeks before the young birds emerge from the den. By this time the burrow is lined with discarded fish bones and scales. This nest may be used again in future years.

The kingfisher is a rugged individualist by nature, fitting well into the western scheme of existence. My wife observed a kingfisher a few years back actively defending a small puddle—undoubtedly exercising his right to be unique! It is likely this quality of independence that endears the belted kingfisher to so many Montanans.

Much of the nationwide interest in birds that has developed over the past decade can be attributed to the "up close and personal" relationship many of us enjoy through feeding them in our backyards. This familiarity has led to a broader understanding of bird life within the greater ecosystem. Although many people make birdwatching the sole objective of their outdoor experience, a growing number incorporate observation of birds in a wider array of activities. Commonly seen birds like the kingfisher are a perfect segue connecting budding naturalists to the hidden world around them.

Every winter, when life in Montana yields to the whims of nature, I reflect on summers past. At this point in my life, watching birds has expanded into the domain of artistic expression, or more appropriately, artistic dabbling. During the placid, serene days of winter, my thoughts often turn to flyfishing and kingfishers. I write reflections, paint memories, and long for the ability to capture one of Ovid's "birds of calm" in an expressive moment. The kingfisher—a bird the color of sky and water—sits and fishes somewhere within the creative reaches of my mind, in a yet-to-be-painted halcyon dream. ■

DONALD M. JONES

RESTORING WILD FISH HABITAT:

The Future Fisheries Improvement Program

by BRUCE RICHARDSON

AL TROTH

Since the early 1960s, Montana Fish, Wildlife & Parks (FWP) has focused much of its attention on protecting and maintaining the essential elements of fish habitat—physical habitat, water quality, and water quantity. Stream protection laws have allowed us (along with local conservation districts) to regulate activities that affect the bed and banks of streams; water quality laws have limited pollutants entering lakes and streams; and instream flow reservations and water leasing efforts have prevented some rivers and streams from becoming increasingly dewatered. For the most part, these programs have maintained the status quo of our rivers and streams.

In 1989, new legislation provided an opportunity for FWP to take a more proactive approach to managing fish habitat—namely, to develop a program for restoring habitat that has been damaged. The River Restoration Act, which earmarks 50 cents from each resident and

How to Apply for Future Fisheries Improvement Grants

- **Who is eligible?**
  Private landowners, conservation groups (with landowner approval), state and federal agencies, conservation districts—anyone!
- **How do I apply?**
  Applications are available at FWP regional offices, conservation district offices, or by writing: Glenn Phillips; Montana Fish, Wildlife & Parks; 1420 East Sixth Avenue; P.O. Box 200701; Helena, MT 59620-0701.
- **Can I get help with the application?**
  Yes. An FWP fisheries biologist can provide biological information as well as estimates of project costs.
- **When are applications due?**
  January 1 and July 1.
- **Who reviews the applications?**
  The Future Fisheries Citizen Review Panel evaluates applications and recommends projects for funding. The Montana Fish, Wildlife & Parks Commission makes the final decisions and authorizes funding for approved projects (usually within two months of the application deadline).
- **Who prepares environmental documents and permit applications for approved projects?**
  FWP biologists will assist with necessary paperwork (e.g., environmental assessments, "310" permits, Army Corps of Engineers "404" permits, temporary water quality variances, etc.).
- **What are my responsibilities if the project is approved?**
  Successful applicants must sign an agreement with FWP stipulating that the project will be completed and maintained as described. Contracting for the work is the responsibility of the applicant.

PHOTOS BY BILL EDELMAN

Ronan Spring Creek, pictured above prior to restoration, was wide and muddy due to improper land practices. Through fencing and other improvements, the creek now runs clear and cold (right).

one dollar from each nonresident fishing license, generates approximately $110,000 per year for habitat restoration. In passing this law, the Montana legislature recognized that the conservation of rivers and their fisheries is of vital social and economic importance to all Montanans.

Between 1989 and 1995, the River Restoration Act funded or partially funded more than 60 stream restoration projects. Fifty-four of these are now complete (see Table 1), and the remainder are nearing completion. These projects are scattered throughout western Montana and many are located on or adjacent to private property. Importantly, most of these projects have been "cost shared"—either through in-kind contributions by private landowners or grants from other sources. On average, program dollars have accounted for only half the project costs.

Because this program has been extremely popular with anglers, the 1995 Legislature revised and expanded it, allocating $2.3 million to wild fish habitat restoration efforts for the 1996-1997 biennium. The new program, known as the Future Fisheries Improvement Program (see Table 2), allows funds to be used to improve habitat in lakes and reservoirs in addition to rivers and streams, thereby providing more opportunities for eastern Montana anglers. Further, the new program gives priority to projects that restore habitat for native Montana fishes such as the bull trout and cutthroat trout.

The Future Fisheries Improvement Program is assisted by a 10-member citizen review panel that recommends projects for funding. The Montana Fish, Wildlife & Parks Commission makes the final decisions. The litmus test guiding funding decisions is: "Will the general angling public benefit from the project?"

The program focuses on natural approaches to restoration. Projects have included riparian fencing and planting of trees and shrubs to restore streamside vegetation; channel reconstruction to improve fish habitat and restore natural channel patterns and dimensions; removal of barriers to fish migration; installation of fish screens on irrigation diversions to prevent loss of fish; bank stabilization using root wads and natural materials that enhance fish habitat; and water leases to improve stream flow in dewatered reaches. Again, cost sharing with private landowners on these projects has allowed dollars to be stretched farther.

The field of fish habitat restoration is rapidly evolving. Treatments considered experimental just a decade ago are now standard practice. Engineering approaches such as riprap, which were once widely used and accepted, are now discouraged. Instead, revegetation of banks and use of natural materials such as root wads allows streams to function more naturally.

Monitoring is also an essential component of the program. We need to understand what works and what doesn't work so that we can focus our future efforts as effectively as possible.

Although FWP's fish habitat restoration program is funded entirely by anglers, the benefits extend beyond fishermen. All Montanans benefit from improved land and water stewardship. Healthy riparian areas enhance the natural beauty of the

The Best It Can Be

For Marshall Ashcraft, restoring natural habitat on private ranchland is not a new idea. He has restored wetlands on his property in Camas, Idaho, improved mule deer winter range on land near Doris, California, and rehabilitated overgrazed grasslands on a ranch in western Nevada. As Marshall puts it, "When it's your property you have a personal interest and duty to properly care for the land."

FWP PHOTO

Marshall Ashcraft

Much of Marshall's life has been spent raising horses and mules. At one time, his California mule operation was the largest in the U.S. It was then that a friend encouraged him to take a fishing vacation in Montana.

The attraction of rivers gradually started to have an impact on him. Marshall saw things occurring on streams that disturbed him. He began to think that he could do a better job of caring for those resources.

In 1993, Marshall got his chance. He acquired a property that had a badly abused spring creek on it, and began to learn more about the specifics of stream restoration. He contacted professional consultants and asked for advice.

The stream, known as Cress Springs, is located on the east side of the Gallatin River downstream from Logan. Subjected to season-long livestock use, the creek was unnaturally wide, extremely shallow, excessively warm, and devoid of most riparian vegetation.

The solution was to excavate a meandering channel of the proper size for the flow, reestablish the riparian plant community, and protect the area with a fence.

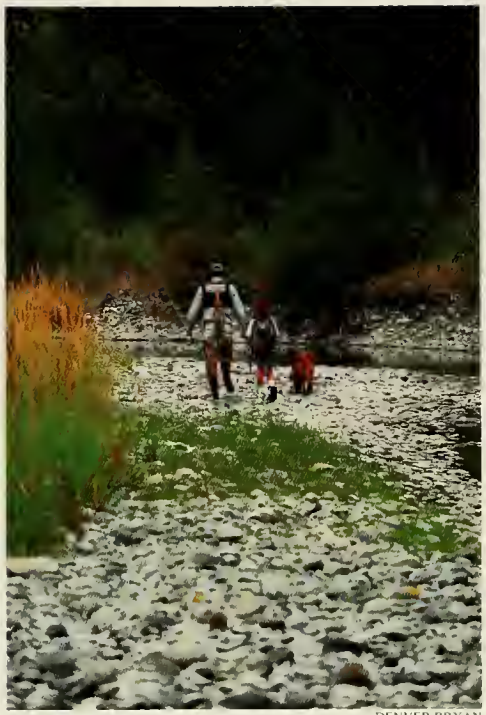
All of the instream work was completed before the Future Fisheries Improvement Program got going. However, the needed fencing had not been installed. Marshall applied for assistance through the program and received a grant.

Now, two years later, the change is dramatic. Where 9,000 feet of channel had supported only four brown trout redds before the project, there were 151 redds in the fall of 1996. Where wide, muddy areas once existed, there is now a defined channel and good riparian vegetation.

What does Marshall Ashcraft get for all his effort? Satisfaction!

Marshall knows that he has helped move the wild fish population a little closer to what it can be. "When the young fish out-migrate to the Gallatin and Missouri rivers, everyone wins," he says. "We all have just a little better place to live—a little more ownership of what's really important."

Thanks to FWP's habitat restoration programs, future generations of Montanans should enjoy good fishing.



DENVER BRYAN

landscape, improve water quality, help maintain stream flows, and benefit wildlife species. Private landowners benefit, too, through increased property values.

The opportunity to restore damaged aquatic habitat is both exciting and rewarding. Although much work remains to be done, it is gratifying to know that the overall condition of fish habitat in Montana is on the upswing and that we can expect our fishery resource to become larger and better with time. Our children and theirs can look forward to enjoying Montana's first-class fishing opportunities as much as we have—perhaps even more! ■

Table 1—Projects Funded by the River Restoration Act (1989-1995)

FWP Region	No.of Projects	Funds Committed
1	4	$ 46,050
2	31	$ 255,150
3	14	$ 198,074
4	7	$ 269,915
5	4	$ 60,000
Total	60	$ 829,189

Type of Project*	Number	Total Funds	Fisheries Benefits
Fish passage	5	$ 52,940	Increased recruitment Hybridization controlled
Bank restoration	6	$ 49,915	Improved cover Improved shading Reduced sedimentation Increased channel stability
Channel restoration & stabilization	16	$ 430,345	Reduced erosion Improved habitat diversity Increased spawning success Improved food production
Riparian enhancement	23	$ 163,377	Improved cover Improved shading Reduced sedimentation Increased channel stability
Fish friendly improvements on water diversions	7	$ 66,807	Increased recruitment Reduction of waste water Reduced sedimentation Reduced fish loss
Spawning channels	3	$ 65,805	Increased recruitment
Total	60	$ 829,189	

* Many of the projects include several categories of work. For summary, projects are grouped into dominant categories.

Table 2—Projects Funded in 1996 by the Future Fisheries Improvement Program

FWP Region	No. of Projects	Funds Committed
1	3	$ 10,680
2	18	$ 279,782
3	16	$ 485,664
4	6	$ 30,100
6	5	$ 23,950
Total	48	$ 830,176

Type of Project*	Number	Total Funds	Fisheries Benefits
Fish passage	1	$ 5,000	Increased recruitment Hybridization controlled
Bank restoration	7	$ 52,440	Improved cover Improved shading Reduced sedimentation Increased channel stability
Channel restoration & stabilization	9	$ 233,706	Reduced erosion Improved habitat diversity Increased spawning success Improved food production
Riparian enhancement	14	$ 129,731	Improved cover Improved shading Reduced sedimentation Increased channel stability
Fish friendly improvements on water diversions	6	$ 144,935	Increased recruitment Reduction of water waste Reduced sedimentation Reduced fish loss
Instream flows & water leases	4	$ 236,500	Improved fish survival Improved riparian vigor
Lake and reservoir enhancement—warmwater fish	7	$ 27,864	Improved game fish recruitment Improved forage fish recruitment
Total	48	$830,176	

* Many of the projects include several categories of work. For summary, projects are grouped into dominant work categories.

RAY BERNTSEN

Lake Elmo: The People's Park

by NANCY HOFFER and SUE DALBEY

LAKE ELMO STATE PARK, nestled within the Billings city limits, is one of only a few urban sites in Montana's state park system. The 123-acre park has two distinct areas. The north side includes a formal recreation area with paved parking, sidewalks, restrooms, and outdoor showers for swimmers. Visitors flock to the swimming area, dropping towels and sunglasses on the grassy picnic areas or on the sandy beach. A sidewalk through the sand eases access to the water, where lifeguards supervise swimming in summer. Sand volleyball courts, concessions, equipment rentals, and a boat ramp provide ample opportunities for activities besides sunbathing and swimming.

In contrast, the south half of the park is maintained in a more natural state. A woodchip trail curves along the southern shoreline, looping through trees and marshy

Lands Legacy

areas. Paths lead from this trail to the water's edge, pointing to favorite fishing spots. A platform rising up through the trees provides a home for nesting ospreys. Russian olives, cottonwoods, and cattails shelter ring-necked pheasants, white-tailed deer, mallards, and songbirds.

The south side of Lake Elmo State Park also serves as the site of the Montana Fish, Wildlife & Parks Region 5 headquarters complex. The headquarters building, constructed in 1989, has offices, conference rooms, and a large interpretive area where wildlife exhibits are on display. Most of Montana's big game species are represented, including full-body mounts of bighorn sheep, mountain lion, and bobcat. Warm and coldwater fish species are featured, as are waterfowl mounts that help birdwatchers identify the migrating flocks on Lake Elmo. Several displays cater to children, including a hands-on exhibit of animal pelts. Outside, pressed into the sidewalk, are tracks of some of the animals that reside in the park (ducks, geese, raccoon, and deer) and some that do not (bears, moose, and elk).

Near the headquarters, a T-shaped concrete pier juts 80 feet into Lake Elmo as a tribute to the long-time supervisor of Region 5, Roger Fliger, who died in 1992. Roger's dream was to build a pier accessible by all people to fish, birdwatch, or simply listen to the water lapping at the shoreline and enjoy the spectacular Montana skies. Money poured in from the Billings Exchange Club, Safari Club International, the Montana Chapter of Safari Club International, the Dingell-Johnson Fishing Restoration Fund, the Billings Rod and Gun Club, and many of Roger's friends and family. Completed in 1994, the pier bears testimony to Roger's special knack for providing the public with outdoor recreational opportunities. Nearly every day someone comes to Roger's Pier—usually with fishing rod in hand.

Lake Elmo supports a warmwater fishery, since the water is diverted from the Yellowstone River and travels through miles of canal before reaching the relatively shallow lake. Yellow perch, largemouth bass, sunfish, black crappie, and channel catfish have been planted since 1983 in an attempt to sustain the fishery. Due to poor spawning conditions, most game fish have not been able to reproduce in the lake. With the help of donations and volunteer labor, FWP has sunk bundles of Christmas trees and wooden "stake beds" in the deepest areas to provide better fish habitat. It is hoped that nesting structures anchored on the bottom will encourage natural fish reproduction.

Although most people fish from shore, electric-powered and nonmotorized boats are allowed on the lake. Testing of gas-powered motorboats is allowed during three weekends in May, but the rest of the summer is reserved for paddleboats, kayaks, canoes, trolling motors, sailboards, and inner tubes.

FWP PHOTO

The Elmo Club, a restaurant and dance hall built on the shore of Lake Elmo by local rancher Elmo McCracken, was a popular Billings attraction in the 1930s.

History

Lake Elmo was created in the early 1900s as a storage reservoir for irrigation water diverted from the Yellowstone River, and is still used for that purpose. Lake Elmo and Lake Elmo Drive, the road leading to the park, were named after Elmo McCracken, a rancher who owned a 400-acre tract surrounding the lake. The Elmo Club, a restaurant and dance hall built by McCracken on the lake's north shore, was a social attraction for Billings residents in the 1930s. McCracken sold the Elmo Club in 1944, and it burned down several years later.

Lake Elmo remained in private ownership through the 1950s and 1960s, but continued to offer the community some water-based recreation. The Billings Waterski Club held ski meets and ski jumping competitions on the lake for many years, but declined an opportunity to purchase the lake in the late 1970s.

As home construction increased in the Billings Heights area near Lake Elmo, concerned citizens began to lobby for park acquisition. In 1980, Larry and Estelle Whitmyer and nearly 40 other residents formed the Lake Elmo Task Force, a group that pushed for legislative action. The efforts of the task force bore fruit in 1983, when the legislature authorized FWP to purchase the 64-acre lake, 10 acres of land on the north shore, and a 60-foot strip around

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RICHARD E. MAYER

TOP RIGHT: *Lake Elmo will be the site of a "Concert in the Park" on July 16.* **ABOVE:** *Roger's Pier is a popular destination for anglers and birders.* **LEFT:** *The FWP Region 5 headquarters has a large interpretive area with wildlife exhibits.*

the lake (6.7 acres). The department also was given a lease agreement with a four-year option to purchase another 42 acres southwest of the lake.

Lake Elmo officially became a state park on July 15, 1983. Though the park had little more to offer than a supervised swimming hole and outdoor toilets, the Billings public swarmed through the open gates. Slowly the park took shape. The SeaBees helped build an office and storage building for lifeguards and installed barriers to define roads and parking areas in the fields around the swimming area. Sand volleyball courts were constructed and concessions for paddleboat, sailboards, kayak, and rowboat rentals established. Although little money was available for improvements during the 1980s, park attendance rose from 21,236 in 1983 to 27,057 visitors in 1991.

The 1991 Legislature proved to be a turning point for Lake Elmo State Park and for the state parks system in general. Representative Francis Bardanouve was instrumental in setting aside $150,000 in matching funds for capital developments at Lake Elmo. This was a test case for other parks in the state as a method of raising money locally for improvements. The Billings community strongly supported Lake Elmo State Park by raising $94,000 to supplement the legislative appropriation. With this new funding, the park was on its way to becoming a major destination for recreationists.

In 1993 Lake Elmo continued to receive priority within the state park system, as another $300,000 was appropriated by the legislature. This, along with $75,000 received from the federal Land and Water Conservation Fund, allowed major infrastructure and capital improvements, including city sewer and water lines, restrooms with showers, a new boat ramp, and sidewalks to make the area fully accessible to the disabled. As a result, park attendance rose to a new record last summer—more than 42,000 visitors from June through August.

Today

Because of Lake Elmo State Park's unique location within Montana's largest city, FWP is challenged to meet the recreational needs of an urban culture, yet maintain the informality and mission of a state park. Lifeguard-supervised swimming is a prominent issue, since managers must balance the need for safety with something that is not a traditional feature at Montana state parks. Lake Elmo is the only state park providing lifeguards, although many other state parks have designated swimming areas.

The Friends of Lake Elmo Association meets each month to help FWP prioritize new projects as funding becomes available, and serves as a sounding board for new activities at the park. Composed of community business leaders as well as members of the original Lake Elmo Task Force, this dedicated volunteer group has been invaluable in providing community support for the park and in attracting public attention to its needs. Friends of Lake Elmo also provides volunteer labor and helps raise funds for park projects.

Many other local organizations

Lake Elmo State Park

Location: North side of Billings.
Size: 64 acres of water and 59 acres of surrounding land.
Access: Travel north on Main Street (Hwy. 87) in Billings Heights and turn left at Pemberton Lane.
Management goal: To provide recreational and educational opportunities for the public.
Facilities: The site features an interpretive center, boat ramp, swimming area, fishing pier, and picnic tables.
Season: Open year-round, sunrise to sunset. No overnight camping.
Miscellaneous: A day-use fee of $1.00 ($.50 for children 10 years and younger) or a State Parks Passport is required between Memorial Day and Labor Day. Summer hours for the swimming area are 10:00 a.m. to 8:00 p.m weekends, and 11 a.m. to 7 p.m. weekdays. Food concessions and equipment rentals are open during summer swimming area hours. The interpretive center at FWP regional headquarters is open year-round (free of charge) from 8:00 a.m. to 5:00 p.m. There is no charge for use of Roger's Pier.
Recreational/educational opportunities: Swimming, picnicking, fishing, wind surfing, wildlife viewing, volleyball, boating with electric-powered or nonmotorized craft (motorboat testing is allowed during three weekends in May).The designated swimming area is staffed with lifeguards during summer months. The nature trail is open to hiking in summer, spring, and fall and cross-country skiing in winter.

RAY BERNTSEN

contribute to the park as well. Groups such as the Heights Kiwanis, Billings Fishing Club, Billings High Country Divers, Billings Boat Club, and various radio stations help with monetary or "in-kind" donations and volunteer labor during clean-up days, tree plantings, fish habitat enhancement projects, and special festivities. Numerous Eagle Scout badges have been earned by Boy Scouts at Lake Elmo. The results of their hard work can be seen in a walk through the park: redwood benches along the woodchip trail, nature trails, an osprey nesting platform, and picnic tables.

Several organizations help with park maintenance and upkeep to stretch the park budget and increase community involvement and ownership. The Montana Conservation Corps built and now maintains the woodchip trail. This group helps with fence maintenance, tree planting, and landscaping. Individuals from the Montana Corps Link also help maintain trails and perform minor landscaping and basic park clean-up to fulfill community service assignments.

Several new projects are planned for Lake Elmo State Park to maintain existing facilities and complete the master site development plan. Smaller projects, such as additional boundary fencing and more landscaping, will be accomplished through donations and volunteer groups like the Montana Conservation Corps. Expanding the irrigation system and installing a small picnic shelter near the boat ramp will require more expertise and equipment. An improvement that will require substantial contracted work is a large picnic shelter on the northeast shore to accommodate groups of up to 150 people. Exxon is helping fund this $60,000 effort, which FWP hopes to have completed by this fall.

"The two most meaningful words throughout Lake Elmo's existence have been 'partnership' and 'ownership,'" says Ray Berntsen, FWP parks manager for Region 5. "Partnerships were important in the past in getting the park established, and they continue to be just as important as organizations and volunteers work with us to maintain and improve the park."

Many private landowners and families who enjoyed the lake for many years had the foresight to think of it as a park that should belong to all people. Today, as individuals and organizations work on park projects and become involved in annual functions, they take pride in the park and treat it as their own.

"We are seeing signs that ownership is being claimed by the future, too, as the next generation gets involved," says Berntsen. Artist Mark Fliger, son of Roger Fliger (for whom Roger's Pier is named), created the artwork in the "Trail of Homes," an interpretive brochure for the woodchip trail. And Larry and Estelle Whitmyer work alongside their son, Larry Jr., in the Friends of Lake Elmo Association.

Involvement from many community organizations and private citizens has helped make Lake Elmo State Park what it is today. Indeed, the metropolitan location and the unique partnership between park managers and users have made Lake Elmo an exceptional part of our state park system. ■

TAILWATER TROUT

by DAVE CARTY

Dams. If you're a stream fisherman, you either tolerate them or hate them with white-knuckled fury, but few anglers actually *like* them. Still, they have their advantages, not the least of which is the improvement in trout habitat where trout habitat may not have existed before. Although that tradeoff is not always applauded (Arkansas' White River was a fine smallmouth bass stream before Bull Shoals Dam created an even finer trout stream), you're stuck with it, like it or not.

Things could be worse.

Missouri River photo by Donnie Sexton

BELOW: *Cold water from the depths of Bighorn Reservoir makes the Bighorn River below Yellowtail Dam a highly productive trout fishery.* **BOTTOM:** *While most tailwater anglers use flyfishing gear, spinners and spoons often work fine.*

DALE C. SPARTAS

E. NEALE STREEKS

Compare a tailwater stream with a typical prairie stream. The heat of August and early September can all but evaporate prairie streams, and the warm water may send the productivity of the rest straight down the toilet. A tailwater stream, on the other hand, is the product of a kind of overflow valve on a huge, manmade refrigerator, the reservoir. Water cooled in the reservoir's depths is siphoned downstream, providing a climate-controlled living room for trout. True, the fishing in free-flowing streams will pick up again with fall's cooler weather, but for a month or two in mid to late summer, the gambling man hedges his bets by fishing below a dam.

Unfortunately, tailwaters are no longer much of a secret, and most of the larger streams in Montana are hit hard. To protect these rivers, Montana Fish, Wildlife & Parks (FWP) has enacted a slew of special regulations—in many cases, enacting slot limits or restricting anglers to the use of flies or lures.

Are the headaches worth it? I think so. A tailwater's cool flows can mean dry fly fishing when nontailwater fish are taking nymphs; actively feeding trout when trout in other rivers are sulking. And the regulated current provides ideal conditions for year-round growth. Why? Because the water—not too high or too low, not too hot or too cold, offers fish a rich aquatic food supply. Given these ideal conditions, trout don't concentrate in pools, but spread out across the river where they're easier to locate.

Even a downpour won't muddy most tailwater fisheries. During a blistering heat wave a few years ago, Billings optometrist Rich Stanich and I floated the Bighorn River. We came well armed, and into his 12-foot Avon raft we stowed bottles of sunscreen, gallons of water, and a cooler full of cold drinks. Almost as an afterthought, we tossed in raingear. Good thing, too. It poured all day, and although both of us looked like we'd spun through the rinse cycle of a washing machine, the river remained clear and the fishing remained good. Rich told me we'd have no problems with runoff until we reached a tributary 10 or 11 miles downstream. He was right, and the Bighorn began to cloud only after we crossed the tributary's coffee-colored inflow.

Although tailwaters can be loaded with trout, their numbers often diminish at a definite point downstream where the cool release water begins to warm. Fishing below that juncture can be iffy. I learned this the hard way on a backpack trip into the Grand Canyon. I had read of the fabulous fishing on the Colorado River below Glen Canyon Dam, so, with visions of eight-pound rainbows swimming in my head, I stuffed a spinning rod and lures into my pack and set off for Arizona.

When we reached the Grand Canyon, however, I discovered that the stretch we planned to hike was miles below the fishable section of the Colorado—and since it was too late to change our itinerary, the rod and lures stayed in my car.

Tailwater streams usually support a plethora of tiny insects, although there are exceptions—the Madison River below Ennis Lake, for example, produces its famous hatch of kite-sized stoneflies every June. Generally, though, smallish dries and nymphs carry the day: No. 18 to 20 Adams, No. 16 to 20 Pheasant Tail Nymphs, No. 14 to 16 Hare's Ear Nymphs, and so on.

More out of custom than necessity, most tailwater anglers use flyfishing gear. I've found that on rivers where flies and lures are allowed, spin fishermen are a rarity, but those who choose hardware rarely suffer for it. Despite the Lilliputian insect life, spinners and spoons seem to work just fine. Perhaps the fish are bored with the endless parade of microscopic nymphs. In any case, when flies aren't working, a Panther Martin or small spoon is definitely worth a try.

On the other hand, spin fishermen, like fly fishermen, can also use artificial nymphs. I stumbled onto this method as a kid. I wasn't much of a fly fisherman back then, but I was a better than middling bait fisherman, and one day I hit upon the idea of drifting artificials like I drifted bait, with a spinning rod. The technique was simple. I'd tie a nymph to my line, pinch enough split shot above it to sink it quickly, and then cast upstream, following the drift with my rod and stripping or reeling in slack line with my free hand. With the line kept taut in this way, strikes were easy to detect.

Moss, or whatever they call the green stuff that clogs so many tailwaters, is a problem at times, making casting a three-step chore: cast, retrieve, and clean your hook; cast, retrieve, clean, and so on. Consequently I've learned to snap moss off when I'm flyfishing with a good hard backcast. For this and other reasons, I rarely use strike indicators when I'm nymphing; rather, I tie my leaders with a fluorescent butt section made with Amnesia shooting line. The fluorescent butts are a bit harder to see than bobber-type strike indicators, but they're a lot easier to cast and considerably more symmetrical, at least to me.

In the heat of mid-August, tailwaters generally have more consistent flows than nontailwater streams, but their levels can still vary. Irrigation can drop smaller streams noticeably...or raise them again just as quickly. That's not always bad, however. My friend Chris Ricardi was

DALE C. SPARTAS

The cool flows of tailwater streams can mean actively feeding trout when fish in warmer waters are less active.

fishing a stream one day when the flood gates on a temporary diversion project swung open and he suddenly found himself knee deep in swirling water. Chris continued to fish (Chris would have fished through Pearl Harbor), and caught half a dozen browns from 14 to 17 inches long, no small wonder considering that neither of us had ever *seen* a trout over 12 inches long in that creek before. Evidently, the sudden rush of cool water had rung some dinner bells.

Sometimes, water-level fluctuations can be learned ahead of time by calling the agency in charge of the dam. Somewhere, somebody will know the release rates on a day-to-day basis, and a quick check with him or her can be a crucial head start to a trip. In fact, it's not a bad idea to keep some sort of running journal on release rates vs. fish caught. In my Colorado youth, I fished the South Platte River every summer, checking its flows before each outing. After a while, I learned that a certain release rate, roughly 150 cubic feet per second, was ideal for the type of fishing I enjoyed, whereas rates above or below that were tougher for me to handle. Others had different preferences. One friend fished the river when it was barely moving; another liked flows at near flood stage—not always great for fishing, maybe, but excellent for keeping the crowds away.

Unfortunately, the hotter the weather, the more popular tailwater rivers become, as anyone who has fished the Bighorn will tell you. If you can't beat the crush by fishing during the week or arriving early in the morning, then you may want to spend time looking for smaller tailwater creeks. There are plenty around, and no, I'm not going to tell you where they are. But dams aren't hard to find (as the Army Corps of Engineers discovered, you can't really hide the things), and in trout country, the downstream stretches of nearly every one will hold fish. These modest structures, which release surplus water over the top, don't have the cooling capacity of large, release-from-the-bottom dams, but they do regulate flows, and often provide relatively clear water even after midsummer storms.

Furthermore, creeks are a joy. The trout run smaller, although they'll surprise you sometimes, and they lack the sophistication of their educated big brothers. But so what? Those are problems I can easily live with, and there's a lot to be said for solitude or fishing with just one good buddy.

With that in mind, my late friend Norm Strung and I once spent an afternoon on a local but relatively unknown tailwater stream north of Yellowstone Park. Out of habit I rigged up my flyrod, and since the mercury was flirting with ninety, opted for nymphs, weighted like anchors and dragged through the deepest pools. Norm, as was his habit, stuck with spinners, and while I plugged away, he fished the riffles and runs like a bass fisherman working structure. He took several rainbows up to 15 inches long, not at all bad for a stream we could almost jump across. I stayed on the moral high ground and stuck with flies, and finally caught a few trout myself. Even a blind hog finds an acorn once in awhile.

It will come as no surprise to many that the pool directly below a dam often holds the biggest fish in the river. Why? Because the water there is highly oxygenated, and trout will concentrate there when hot weather and warm water in the rest of the river (which contains less oxygen) forces them there, either for comfort or survival. On the larger, cooler tailwaters that draw their flows from the lake's bottom, itinerant browns and rainbows still stack up below dams because there's no place farther up they can go.

Like the dams themselves, these places aren't secrets. In high school, I used to fish a pool below the dam that backed up our town's water supply. I fished primarily with bait in those years, and it was a rare day when I didn't catch at least a few 10-inch fish. I knew there were bigger trout to be had, of course, but I didn't know just how big until I opened the local paper one morning and spied the picture of a nine-pound brown taken from the same pool, and an angler, all smiles.

Was I surprised? Yeah, you could say that. And you could also say that I was jealous and a little peeved that it hadn't been me. But I got over it.

Really. ■

• In 1996, over $525,000 was spent on improvements to upland game bird habitat in Montana through the Upland Game Bird Habitat Enhancement Program. Since the inception of the program in 1989, FWP has entered into over 660 program contracts with agricultural operators and other land managers.

• In coordination with the Montana Department of Livestock, FWP in 1996 appointed a game farm negotiated rulemaking committee and contracted with the Montana Consensus Council to facilitate the rulemaking process for game farms authorized by the 1995 Legislature. Rulemaking will be concluded in 1997.

• In 1995, the latest year for which complete stocking records have been compiled, 37.8 million fish were stocked in support of FWP's fisheries management activities. Of these, 30.1 million were in support of warm water fisheries and 7.6 million were cold water species, most of which were stocked in lakes and reservoirs.

In striving to reach our goals we are... managing *with a focus*

• Conservation easements continue to be FWP's principle tool for protecting valuable wildlife habitats through the Habitat Montana program. In 1996 alone, conservation easements were used to protect wildlife habitat on 27,760 acres of land, including 19,061 on the Sieben and O'Connell ranches north of Helena, 7,106 acres on the Keogh property at Whitehall and 1,584 acres on the WH Ranch near Anaconda.

• FWP, in concert with a citizen's advisory group, prepared a draft plan during 1996 to guide management of Montana's warmwater fishery (walleye, bass, catfish, etc.) over the next decade. The plan aggressively pursues improvement of warmwater fishing in Montana through stocking, regulations, habitat improvement and educational efforts.

• In February, FWP officially became a member of the Interstate Wildlife Violator Compact, joining Arizona, Colorado, Idaho, Nevada, Oregon, Utah, Washington and Wyoming. Under the compact, residents of member states that are convicted of serious violations of fish and wildlife laws in their own or other member states may have their hunting, fishing or trapping privileges suspended in all member states.

• Montana's Future Fisheries (fish habitat) Improvement Program was expanded in 1996. Forty-eight restoration projects were approved for funding. Program cost was approximately $830,000 in 1996 and generated over $1.8 million in matching funds. Projects will enhance spawning and rearing habitats, improve riparian vegetation and bank cover, reduce loss of fish into irrigation diversions, enhance stream flows and restore fish passage. Projects were approved for all regions of the state, aiding cold and warm water fish species.

• FWP, in cooperation with the Bonneville Power Administration, hired two additional game wardens to increase enforcement and education activities to reduce poaching and unintentional harvest of bull trout in Montana.

• Bull trout status reviews are now complete for 12 drainage basins in western Montana. Local bull trout watershed groups were formed in the Blackfoot River and Rock Creek areas.

• FWP organized the Governor's Westslope Cutthroat Trout Workshop in September 1996. This event provided a focal point for cooperative efforts by FWP, federal land management agencies, local landowners and others to take actions to benefit westslope cutthroat trout. The most ambitious proposal announced to date involves restoring westslope cutthroat to tributaries of the upper Madison River.

• The TIP-MONT program continues to be a very successful aid to law enforcement efforts. In 1996, nearly 400 reports were received and 134 citations issued, including five for felony violations. Over 30 years of combined suspensions of hunting and fishing privileges were levied, as well as over $38,000 in fines and restitution. The TIP-MONT number is now reaching a world-wide audience with its inclusion in the pages of FWP's new Internet site.

• In September, FWP was awarded $937,000 in federal grants from the U.S. Migratory Bird Conservation Commission for wetlands conservation and other waterfowl habitat improvements in northeastern and north-central Montana. Projects will entail restoring and enhancing more than 20,000 acres of critical wetlands and grassland uplands critical for waterfowl and other migratory birds as nesting habitat. Ducks Unlimited will be contributing more than $600,000 to the projects.

• Continuing studies of pallid sturgeon since 1989 provide an estimated adult population of only 250 in the lower Missouri and Yellowstone Rivers in Montana. No evidence of juvenile or young pallid sturgeon have been found. FWP will attempt to artificially spawn pallids in the spring of 1997, if successful, young pallids may be reintroduced in the Missouri River above and below Ft. Peck Reservoir.

MULE DEER: *concerns prompted special measures*

FWP surveys in 1995 indicated that significant portions of the hunting districts in southwestern Montana and some in the area of the Missouri River Breaks did not meet mule deer management objectives because of low numbers of bucks and prompted a review of hunting regulations. At the same time, the overall population of mule deer was declining in several areas of the state.

Mule deer populations, like those of all wildlife, fluctuate--sometimes quite noticeably. The latest decline in overall mule deer numbers in some areas of Montana was the result of the extremely dry summers of 1994 and 1996 and a couple of harsh winters that reduced fawn survival and made deer more vulnerable to predators. To address the overall decline in mule deer populations, the FWP Commission reduced antlerless mule deer licenses for 1996 by approximately 30,000.

Equipped with public comments garnered through a series of mule deer "summits" conducted across the state last summer, FWP commissioners have since taken a number of steps for 1997 in their continuing efforts to responsibly address the present mule deer situation. In finalizing deer seasons for 1997, the commission included a regulation requiring hunters to designate (validate) areas in which they will hunt in southwestern Montana to restrict hunter movement in the state. Also, special mule deer permit-only buck hunting areas will restrict hunters to those areas where their permits are valid. In addition, $50,000 has been redirected to surveys of deer populations, expanded research will allow us to better manage mountain lions in relation to deer populations and other measures are being considered to better address public concerns and improve the management of mule deer populations.

WHIRLING DISEASE: *update 1996*

During 1996, major waterways that tested free of whirling disease included the Yellowstone, Bighorn, Stillwater, Boulder (of the Yellowstone), Gallatin, East Gallatin, Big Hole, upper Missouri (headwaters to Canyon Ferry Reservoir), Teton, Bitterroot, Flathead, Kootenai and Marias rivers, Big Spring Creek, and the Madison River above Quake Lake. Montana's nine state, three federal and 10 private fish hatcheries remained "clean."

In 1996, isolated pockets of infection surrounded by "clean" waters were discovered in Cottonwood Creek (Blackfoot Drainage), in the East Fork Rock Creek (Rock Creek Drainage near Missoula) and in the Missouri River below Holter Dam and one of its prime spawning tributaries, Little Prickly Pear Creek. How whirling disease is spreading from water to water is a question that future testing could help to resolve.

Laboratory and field testing of various salmonid species and strains have found that cutthroat trout (both westslope and Yellowstone) and all strains of rainbow trout tested are very susceptible to this disease. Other native salmonids, such as bull trout and Arctic grayling, have received very limited testing, but early indications of resistance are promising.

During 1996, an Action Plan that addresses research, management and communications priorities was developed by the Montana Whirling Disease Task Force. This action plan subsequently attracted the federal and private funds necessary to construct a new research facility in Montana and the dollars to support the aggressive research needed to combat this threat to the state's world-renowned fisheries.

REPORT

• A record number of volunteer hours were contributed to Montana's State Park System in 1996. Over 800 volunteers donated 35,460 hours of service to Montana State Parks at a value of almost $205,000 to the agency this year.

• FWP's Parks Division acquired 1,232 acres adjacent to Ulm Pishkun State Park. The new parcel will be home to a planned educational and interpretive center for what may be the world's largest historical buffalo jump.

• A ribbon-cutting ceremony was conducted at Big Arm State Park in September to celebrate a $500,000 park rehabilitation project. Improvements included road paving, installation of showers, construction of boat launching facilities and development of a swimming area.

• FWP remodeled the visitor center at Lewis & Clark Caverns with new displays and a state-of-the-art model of the cave. Educational offerings at the caverns were expanded, resulting in a 17% increase in school group tours in 1996.

...working to keep our state parks *sound*

• "Bannack Days" at Bannack State Park received national attention through its award as one of the top 50 special events in the five-state Old West Trail Country.

• In 1996, two state park cultural projects were selected for funding through Travel Montana's TIIP (Tourism Infrastructure Investment Program). Pictograph Caves State Park received funding to conduct research to reduce mineral deposits obscuring the pictographs. At Chief Plenty Coups State Park, the interior of the chief's home will be stabilized to allow tours by the public.

...stressing the *importance of* public education

• In cooperation with federal land management agencies and a number of citizen wildlife and agricultural organizations, FWP produced a 28-minute video documentary entitled "Landscape" that takes a new look at the issue of grazing on Montana's public lands and the shared values all Montanans risk losing if we don't focus our attentions on working together for the future.

• In 1996, FWP produced a video and an accompanying brochure on conservation easements and the advantages of these valuable land protection tools to private property owners, county governments & FWP.

• FWP, in conjunction with a private vendor, instituted a 1-900 information "hotline" on a pilot basis in 1996 to provide comprehensive and detailed information to callers on a wide variety of recreational topics, including hunting, fishing and opportunities at state parks.

• 950 volunteer Hunter Education instructors taught and certified 6,400 students in 1996. Instructors also helped develop a new Montana-specific student manual.
475 volunteer Bowhunter Education instructors taught and certified 2,082 students.

• During 1996, new safety education classroom and riding courses were implemented for FWP's Snowmobile Education Program. A total of 53 volunteer Snowmobile Education instructors taught 267 students during the 1995-1996 season.

AQUATIC EDUCATION: *advances*

Montana youths and their families will now have even more opportunities to learn how to cast a line and partake of the state's renowned fishery resources thanks to an expansion of FWP's aquatic education program in 1996.

The five program elements comprising the new educational program, called Family Fishing Adventures, are:
(1) the establishment of a cadre of trained, volunteer angler education instructors;

equipment lending program across the state;
(3) creation of a "free-fishing day" for participants of FWP-approved angler education courses, which will be introduced to the 1997 Legislature;
(4) establishment of an angler education program for Montana schools based on a highly successful national educational campaign; and
(5) creation or development of existing accessible fishing areas for youths and their families.

Three schools in Montana began pilot testing the national "Hooked on Fishing--Not on Drugs" program, and three communities are testing a fishing tackle loaner program. Over 1,000 youths attended angler education courses taught by volunteer angler education instructors.

Montana Fish, Wildlife & Parks

MISSION:

Montana Fish, Wildlife & Parks, through its employees and citizen commission, provides for the stewardship of the fish, wildlife, parks and recreational resources of Montana, while contributing to the quality of life for present and future generations.

GOALS:

- *Manage with a focus on ecological systems to reflect the diversity of all wildlife and their habitats, while maintaining our commitment to Montana's hunting & fishing heritage.*
- *Provide increased opportunities for public enjoyment of fish, wildlife and parks resources, while maintaining our commitment to improve landowner-sportsperson-department relations.*
- *Achieve a quality, financially sound state parks system.*
- *Elevate the importance of public education and participation in all program areas to afford citizens the opportunity to better understand, appreciate and make informed decisions about our natural and cultural resources.*
- *Create a work environment where a diverse workforce can focus on FWP priorities under healthy, satisfying and caring conditions.*

FISH, WILDLIFE & PARKS COMMISSION:

STAN MEYER, *Chairman*, Great Falls
DAVID W. SIMPSON, *Vice Chairman*, Hardin
DARLYNE DASCHER, Fort Peck
CHARLES R. DECKER, Libby
DALE TASH, Dillon

...providing increased opportunities

- In 1996, FWP maintained offices in the 10 largest communities in Montana for the first time in the agency's history. The Butte and Havre Area Resource offices opened their doors in 1996 to provide enhanced customer service and accessibility to the public in south-western and north-central Montana.
- The Ruby River Task Force made significant progress to create public fishing access on the Lower Ruby River. By the end of 1996, negotiations were underway with over a dozen landowners to obtain public access through either easement, lease or fee title purchase.

- FWP's Shooting Range Development Program provided $78,000 in cost-share grants to fund activities and improvements at the Billings Rod and Gun Club, Bozeman Rifle Club, Colstrip Sportsman Range, the Roundup Gun Club, Glendive Trap Club, Whittecar Rifle Range and Great Falls Trap Club.
- FWP conducted its third annual "Becoming an Outdoors-Woman" workshop in August 1996. The workshop provided 100 women from seven different states with the opportunity to try their hands at a variety of outdoor activities.

H.B.195=GREATER HUNTING *access*

Over 100 biologists, game wardens and FWP conservation specialists joined together in implementing a dramatic expansion of hunting access on private land. The Block Management Program grew from 325 areas in 1995 to over 875 areas encompassing over 7 million acres of land in 1996.

This unprecedented growth was due to incentives for landowners that were made possible by the passage of House Bill 195 by the 1995 Montana

Legislature. In 1993, Governor Marc Racicot created the Private Land/Public Wildlife Advisory Council in an attempt to solve problems associated with wildlife and recreation in Montana. The 1995 Legislature took the recommendations of the Council and passed H.B. 195, which ratified a five-year program aimed at reducing controversies associated with wildlife, hunting and private land ownership.

H.B. 195 provides a maximum of $8,000 per year for landowners who provide public hunting on their properties to offset the potential impacts associated with hunting. Revenues generated by the sale of variable-priced hunting licenses set aside for the nonresident elk and deer hunting clients of licensed outfitters are providing the additional funding needed to support these programs. Thanks goes to the Private Land/Public Wildlife Advisory Council.

where the money comes from

budgeted, fiscal year **REVENUES 1997**

- FWP IS FUNDED PRIMARILY BY USER FEES.
- LESS THAN 1% OF FWP'S TOTAL BUDGET COMES FROM THE STATE GENERAL FUND.

HUNTING AND FISHING LICENSES

This includes all license sales revenue, interest earnings and other miscellaneous revenue.

Non-resident sales account for nearly 2/3rds of FWP's total license revenue.

63.5 %
$30,131,760

FEDERAL REVENUES

FWP receives federal monies to: aid in fish & wildlife restoration efforts; for parks development and maintenance; for boating safety, education, regulation; and other programs.

In FY 97 nearly 90% of FWP's federal assistance, or approximately $10 million, was apportioned to Montana for fish and wildlife restoration through the Pittman-Robertson (P.R.) and Wallop-Breaux (W.B.) programs. P.R. monies are derived from an excise tax on sporting arms and ammunition, pistols and revolvers and certain archery equipment. W.B. monies are derived from an excise tax on fishing equipment and electric trolling motors, a portion of the federal fuels tax and import duties on fishing tackle and pleasure boats.

The balance of the federal monies comes from various federal sources and is used for other purposes, including parks projects.

21.5 %
$10,204,733

OTHER STATE REVENUES

Other state revenue sources include: fees for state park use; a portion of the state's lodging facilities use tax; a small percentage of the state fuel tax; interest earnings from coal severance tax receipts; and other miscellaneous revenue sources.

14.1%
$6,707,260

GENERAL FUND

State tax dollars.

0.8 %
$397,324

TOTAL REVENUES: $47,441,077

where the money goes

budgeted, fiscal year **EXPENDITURES 1997**

FWP SPENDS ITS MONEY TWO WAYS:

- OPERATIONS for day-to-day management of fish, wildlife & park resources.
- CAPITAL for major repair & maintenance of FWP properties, for renovation & construction of facilities and to protect and enhance critical habitats.

parks:

operating	$5,427,069
capital	$2,951,500
total	$8,378,569
% of total	17.7

The parks division is responsible for development, maintenance and operation of all state parks and affiliated sites with an objective of providing diverse recreational opportunities while preserving important historical and cultural resources within Montana.

wildlife:

operating	$ 6,749,769
capital	$ 3,514,860
total	$10,264,629
% of total	21.6

The wildlife division is responsible for managing all species of big game, upland game birds, waterfowl, furbearers, non-game birds and endangered wildlife in the state.

fisheries:

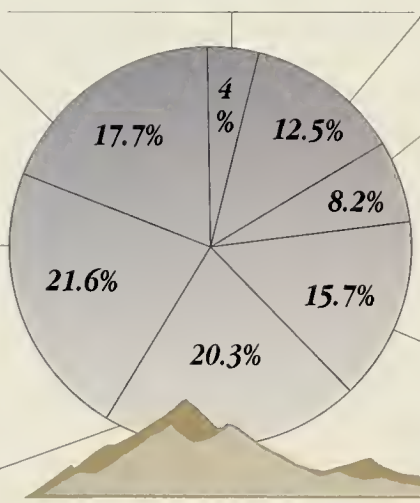
operating	$6,022,994
capital	$3,630,000
total	$9,652,994
% of total	20.3

The fisheries division is responsible for the management and perpetuation of Montana's fish and other aquatic resources.

conservation education:

operating	$1,879,607
% of total	4.0

The conservation education division acts as a clearinghouse for disseminating information on FWP activities and news items to the media and conducts a variety of educational and recreation safety programs.



enforcement:

operating	$5,926,011
% of total	12.5

The enforcement division is responsible for enforcing all the fish and game laws of Montana, FWP rules and Commission regulations. Division personnel also enforce state boating and snowmobile rules and state park regulations as well as private property laws & regulations as they deal with hunting and fishing.

field services:

operating	$3,893,628
% of total	8.2

The field services division is responsible for FWP's lands program, construction projects & landowner-sportsperson's relations program.

management & finance:

operating	$7,160,879
capital	$ 284,760
total	$7,445,639
% of total	15.7

The Helena-based director's office staff makes major policy and administrative decisions. Regional supervisors handle on-the-ground implementation of policies and programs. The administration and finance division is responsible for accounting, purchasing, personnel, data processing and administration of FWP's licensing functions.

FWP TOTAL:	
operating	$37,059,957
capital	$10,381,120
total	$47,441,077

STREAM FLYFISHING - MULE DEER - CANADA GEESE - RELEASING CUTTHROAT - BLACK BEAR - BY DONALD M JONES

STEVE MCMORRAN RECEIVES WILDLIFE AMBASSADOR AWARD

FWP's 1997 "Vince Yannone Ambassador for Wildlife Award," better known as the "Vinnie," was awarded in April to Steve McMorran, caretaker of FWP's Wild Animal Shelter in Helena. Initiated in 1995 in honor of long-time FWP youth educator Vince Yannone, the "Vinnie" recognizes a "Montana citizen whose work, words or spontaneous deeds of compassion aid directly in the conservation of Montana's wildlife."

McMorran was nominated for the award by FWP wardens Chad Murphy and Mike Ottman, who cited numerous acts of compassion on behalf of wildlife by McMorran, but one incident in particular involving two orphaned black bear cubs. Murphy and Ottman had located the cubs in the top of a tall pine tree, and enlisted McMorran's help. Equipped with only a rope and cloth sack, McMorran climbed to the top of the tree, where he was able to rescue one of the cubs and place it in the sack. The other cub fell, but was safely netted by the wardens. "When Steve was a third of the way down the tree," wrote Murphy and Ottman, "a branch broke. He fell at least 30 feet, landing on his back with the cub protected in his arms. Thankfully, both Steve and the cub recovered from the fall. We think this classic, selfless, and Vince-like act of compassion for two black bear cubs exemplifies the criteria for being awarded the 'Vince Yannone Ambassador for Wildlife Award.'"

DAVE BOOKS

Steve McMorran

A San Diego native, McMorran moved to Montana in 1977. He met Vince Yannone through their mutual interest in wildlife, particularly falconry. "Vince was my sponsor when I applied for my falconry license," said McMorran. I started helping Vince feed his birds and when a job opened up at the FWP Wild Animal Shelter in 1988 I applied."

According to Murphy and Ottman, McMorran has devoted much of his own time and money to at-home facilities for animals like mountain lion kittens and raptors. He recently spent countless hours of his own time negotiating for the use of Fort Harrison as a space to house and exercise birds of prey. Over the years he and his wife, LuAnn, have been responsible for the recovery of hundreds of birds of prey at their Helena Valley home. He has volunteered for Project WILD training and gives dozens of talks and presentations to audiences of all ages every year. McMorran was chosen for this year's "Vinnie" award from a field of 17 worthy nominees.

COMMISSION APPROVES NEW WARMWATER FISH MANAGEMENT PLAN

In April of 1997 the Montana Fish, Wildlife & Parks Commission approved a new statewide warmwater fish management plan. This plan, which will direct the state's warmwater fisheries for the next 10 years, culminated 16 months of work and planning, including more than 2,000 angler surveys, development of a draft plan for public comment, and 18 public meetings throughout the state.

The new plan provides priorities for warmwater management within each of FWP's seven administrative regions. Key waters within each region are addressed in terms of needs ranging from facility development to special regulations. In some cases, such as new species introductions, the Montana Environmental Policy Act (MEPA) will guide the final decision-making process, but the new plan dictates which projects will undergo MEPA analysis.

An 18-member Citizen's Advisory Group, which played a critical role in developing the new plan, will be maintained to provide ongoing assistance. The Citizen's Advisory Group and FWP fisheries staff will meet annually during the 10-year duration of the plan to set priorities, discuss new planning efforts, and review progress on management activities such as stocking, access, and site development.

Anglers and other interested parties can obtain a copy of the warmwater fish management plan by contacting the nearest FWP regional office or the Fisheries Division, Montana Fish, Wildlife & Parks, 1420 E. Sixth Ave., Helena MT 59620-0701 (406/444-2449).—*Jim Satterfield, Fisheries Management Bureau Chief, Helena*

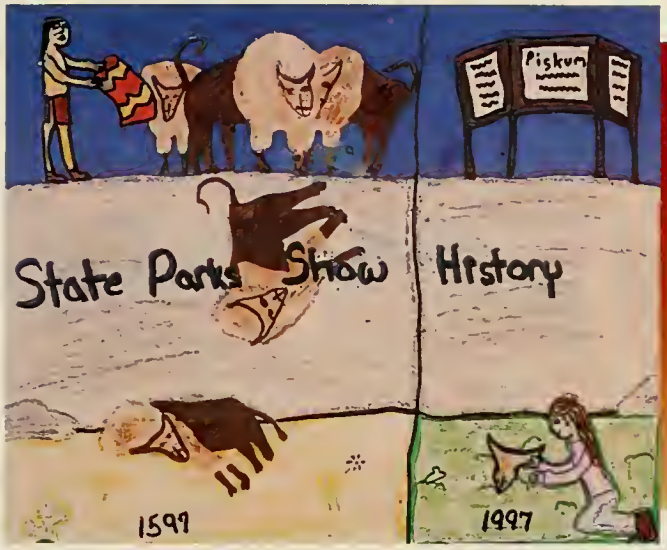
DALE C. SPARTAS

Northern pike

State Parks Preserve History

1st Place
Bryan Foley, Lewis & Clark School, Missoula

Bryan's watercolor poster depicts a time gone by when bison roamed the plains and Indian tepees were the only human dwellings within sight of what is now Madison Buffalo Jump State Park near Three Forks. For his winning entry, Bryan received a $150 savings bond and a T-shirt with his poster screened on the front. His school received a Lewis and Clark Caverns video and a copy of *Great Escapes*, a book about Montana's state parks, for its library.



2nd Place
Kindra Clark-Snustad, Clancy Elementary School, Clancy

Kindra's colorful poster demonstrates the spirit of long-ago buffalo hunts and the Native American history so evident at Ulm Pishkun State Park near Great Falls. She received a $100 savings bond and a T-shirt.

During the 1996-1997 school year, Montana Fish, Wildlife & Parks (FWP) conducted its sixth annual State Parks Poster Contest for fifth-grade students. The theme for this year's contest was the historical essence of Montana preserved by state parks. In April a panel of five judges selected the winners from an assortment of creative posters received from fifth-graders across the state.

The winning entries have already been displayed in Helena and Missoula, and will be on display at FWP regional headquarters during the following times: Kalispell, 6/30 to 7/18; Bozeman, 7/21 to 8/8; Billings, 8/11 to 8/29; Miles City, 9/1 to 9/19; and Great Falls, 9/22 to 10/10.

3rd Place (tie)
Jennifer Bushnell, Emily Dickenson School, Bozeman

Jennifer's imaginative poster illustrates the dramatic scene of a buffalo hunt at Madison Buffalo Jump State Park. She received a $50 savings bond and a T-shirt.

3rd Place (tie)
Jake MacDonald, Eureka Elementary School, Eureka

Jake's creative poster depicts the frontier history preserved at Bannack State Park near Dillon. He received a $50 savings bond and a T-shirt.

3rd Place (tie)
Katie Child, Cold Springs Elementary School, Missoula

Katie's watercolor poster illustrates a ghost town building at Elkhorn State Park. She received a $50 savings bond and a T-shirt.

BANNACK DAYS:

Celebrating Life on the Montana Frontier

by Cindy Staszak, Manager
Bannack State Park

As you stop to watch the blacksmith labor over the hot forge, creating form and function from raw metal and fire, a stagecoach passes by carrying a merry load of passengers. The sharp ping of a muzzleloader's ball hitting a metal target echoes from up "Hangman's Gulch." Within the cool confines of the 1877 church, gospel singers sweetly fill the room with praise and worship.

Outside, a crowd suddenly begins to gather in the center of town. A dispute has broken out between the sheriff and a town drunk. As the two exchange threats and barbs, an accomplice steps out of the Hotel Meade, challenging the sheriff. Gunfire is exchanged. The wailing of the dancehall girls, pining for one of their favorites, can be heard over the last of the gunfire as bodies are unceremoniously dragged off the dusty street.

Soon the busy pace of life begins again. Children laugh as they hop along in a three-legged race. The smell of kettle popcorn and buffalo burgers fills the air. A boy smiles nervously, clutching the reins a little too tightly on his first horse ride. An elderly gentleman fondly relives his past as he talks to the telegraphers. The cry of "I found gold!" on the east end of town begins a mini-gold rush in a ritual etched long ago in the earth of this abandoned mining town.

Bannack Days—a celebration of life on the Montana frontier—has been taking place in Bannack State Park on the third weekend in July for more than 20 years. The colorful event, which gives visitors an opportunity to step back in time and experience history where it actually happened, is scheduled for July 19 and 20 this year.

Bannack Days began in 1976 when Roy Herseth, former Bannack State Park Manager, attended a meeting of the Beaverhead County Bicentennial Planning Committee and suggested that Bannack would be the perfect place to stage a bicentennial celebration. Often called the "cradle of Montana," Bannack was the site of the state's first major gold rush in 1862 and later became the first territorial capital.

Ann Dooling gives a spinning demonstration on her "great wheel."

Dick Ellis, former parks manager for FWP's Region 3, was one of the originators of Bannack Days. "That first year, we had four weekends where we focused on different types of skill demonstrations," he says. "We were quite amazed to see how popular it was, and quickly realized that we could only handle a celebration of this caliber one weekend per year."

Historic skill demonstrations have always been the foundation of Bannack Days. Del and Barbara Morris have been participating since the beginning, and have only missed one celebration. Of their original involvement, says Barbara, "We read about it on a placemat in a pizza place in Bozeman and just showed up with our muzzleloaders." Del, who has been firing muzzleloaders since he was 13 years old, also remembers the first event. "They had such a great turnout that they asked us to spend the weekend and help out with the muzzleloading demonstration."

The Morris children grew up with Bannack Days being a part of every summer. Barbara remembers their baby sleeping on the front seat of the 1931 Model A pick-up truck they used to haul their supplies, while she and Del showed visitors the intricacies of firing the rifles. "Now the boys are an important part of giving the demonstrations," says Barbara.

Other skill demonstrations include candlemaking, blacksmithing, spinning, weaving, quilting, basket making, bonnet making, gold panning, Dutch oven cooking, roping, log cabin building, and telegraphy. Visitors not only enjoy watching these specialized skills but are thrilled to have the opportunity to try their hand. Del Morris remembers a man from Japan who had never held a gun before and was ecstatic over the chance to actually fire a muzzleloader. Children and adults alike line up to dip their own candles. And it is not unusual to see a wide-eyed youngster helping Jim DeBoer crank the handle on his forge as he prepares the coals for another round of blacksmithing.

Ann Dooling has been giving spinning demonstrations at Bannack Days for the past five years. Her "great wheel" is the oldest object at Bannack, even older than the rusting dredge buckets along Main street or the rotting timbers of the Bannack jail. "The wheel was built in the 1700s and for many years belonged to the family of President Polk," says Dooling. "The great wheel is an early version of the spinning wheel. It is very tall, and you stand to operate it rather than sit. It also has a spindle rather than a bobbin." During Bannack Days, Ann gives demonstrations on both types of spinning wheels.

A variety of musical and theatrical activities add fun and excitement to Bannack Days. Music includes every-

Left: *The Bannack blacksmith fires his forge.*

Below: *Muzzleloaders, gold panning, and old-time gunfights will all be part of the Bannack Days celebration on July 19 and 20.*

thing from fiddlers and country western bands to gospel singers in the church and wandering barbershop quartets. This year's lineup features Native American singer and songwriter Jack Gladstone, the Idaho Old Time Fiddlers, Montana Red, the Sweet Adelines from Dillon, gospel singers from Horse Prairie and Salmon, Idaho, and cowboy poets and musicians from a tri-state area.

In addition to music, a variety of melodramas are on tap. The always-entertaining Crazy Coyote players from Wise River will provide a closer look at the life and times of the Montana pioneers. The Dillon Masonic Lodge will portray the rise and fall of Bannack Sheriff Henry Plummer, as the "Just Us Gunfighters" hang the dastardly sheriff at least once per day. A seventh infantryman in full uniform will discuss the life and dress of a soldier of the time. Mountain men, too, will demonstrate their specialized survival skills.

Initiated three years ago, the lecture series in the old schoolhouse has quite a following. The wooden desks in the one-room school offer a quiet respite from the hustle and bustle of main street. Topics vary from the vigilantes in Montana to an explanation of the Morse Telegraph. This year Ann Dooling will explain the intricacies of spinning and demonstrate the differences between the two types of wheels she uses.

Add to all this the food concessions, free horse rides for children, Model AA rides, old-fashioned games, gold panning, and historic tours and you have the makings of an exciting day for the whole family. More and more visitors are wearing pioneer clothes and costumes to Bannack Days, helping to make history come alive.

What makes Bannack Days even more special is the tremendous volunteer effort responsible for the event's success. Almost every skill demonstrator, car parker, school house lecturer, and litter picker-upper is a volunteer. Occasionally funds are available to reimburse those traveling long distances, but most participants pay their own expenses. It takes a special kind of person to spend two days in the hot July sun, dressed in very warm but historically accurate clothing, demonstrating pioneer skills for the mere fun of it!

Bannack Days is truly a gem and a "must see" celebration. Dust off your cowboy hat or bonnet and plan now to attend on July 19 and 20. Breakfast will be served in the Hotel Meade from 7:00 a.m. to 10:00 a.m., with skill demonstrations beginning at 10:00 a.m. Activities will take place until 5:00 p.m. both days. Bannack State Park is located 25 miles southwest of Dillon, Montana, just off Highway 278. For more information about Bannack Days or Bannack State Park, contact the park at (406) 834-3413.

REPAIRING VANDALS' DAMAGE IS INDEED COSTLY

Just finished reading Carillon Steorts' article on vandalism in the May/June 1997 issue of *Montana Outdoors*.

Having spent 11 years working for the FWP in and around the Canyon Ferry area before my retirement in 1993, I know firsthand about the vandalism problem.

On page 24 of Steorts' article she states that to build a new fee booth at Spring Meadow State Park to replace the old one that was struck by a vehicle will cost "thousands of dollars." Well, I built the fee booth that is going to be replaced sometime in the late 1980s, and it would be pushing things to say there was a thousand dollars worth of material in it! It was built at our Canyon Ferry maintenance shop, then hauled to Spring Meadow. There were no blueprints, engineering studies, or contractors involved. We knew what we wanted...and we built it.

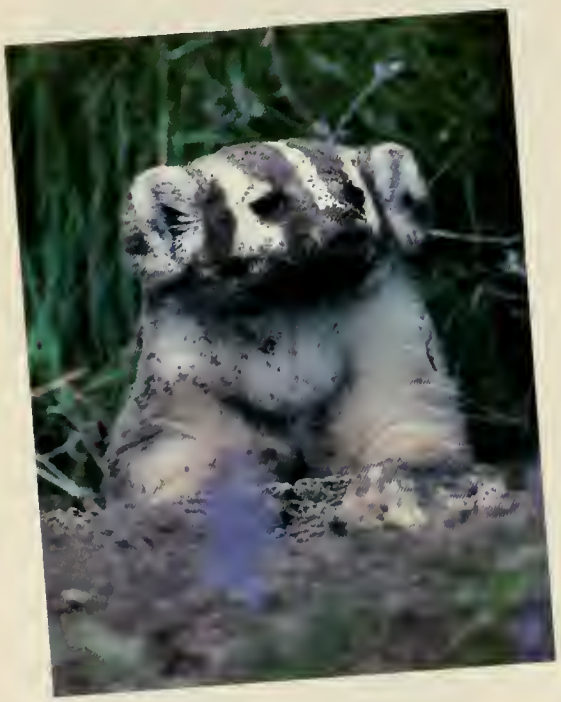
Is this new fee booth going to be another "government $600 toilet seat"?—*John L. Stoner, Townsend*

Today we must comply with additional regulations for FWP projects, structures, and facilities. The fee booth at Spring Meadow Lake State Park was repaired by private contactor (through the bid process) at a cost of $1,878, less the finished painting. Repair of vandalized structures is indeed expensive due to cost of materials, conformation to building codes, and construction standards that are scrutinized by more than in-house personnel.—Mike Sullivan, Park Manager, Helena Area Resource Office

HATS OFF TO JOSLIN

I want to thank you for publishing "Lands Legacy: Linking Prehistory to Posterity," by Gayle Joslin. Her account of the wildlife corridor extending from Glacier National Park down to Gates of the Mountains Wilderness and beyond to Yellowstone Park was just put together superbly.

She had me following the footprints of the elk herd step by step in the snow. Thanks again, and to you Gayle Joslin, I bow and take off my hat.—*Joe Mingoia, Livermore, California*



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Contributors

The story of whirling disease in Montana's wild trout fisheries is a rapidly changing one, says **Tom Palmer**, who has chronicled the spread of the disease for *Montana Outdoors* since its discovery in the Madison River in 1994. In "The War on Whirling Disease" (p. 2) he summarizes the latest findings of researchers in Montana and at the University of California. While there appear to be no quick fixes, says Palmer, much has been learned about the whirling disease life cycle, and this new knowledge may lead to strategies that can help trout avoid infection. For example, scientists believe that if newly hatched trout fry can avoid the parasite for the first month, their chances of survival increase dramatically. Palmer is an information officer at FWP headquarters in Helena.

Palmer

"The kingfisher is the favorite bird of many people, even those who aren't avid birdwatchers," says **Jerry Kustich**, author of this issue's "Watchable Wildlife" segment. In his article, "A Halcyon Dream" (p. 10), he relates the role of the kingfisher in Greek mythology and describes the life history of this common and colorful Montana bird. As Kustich observes: "For we humans, becoming a good fisher takes much practice. But for this bird, it is a matter of survival—no 'catch and release' here." Kustich, who writes a weekly bird column for the *Montana Standard*, lives in Twin Bridges.

Kustich

In 1989 the Montana Legislature passed the River Restoration Act, which earmarked money from fishing license sales for stream-side habitat improvements. According to FWP's **Bruce Rehwinkel**, this program funded more than 60 stream restoration projects between 1989 and 1995. In 1995 the legislature expanded the act to create the Future Fisheries Improvement Program, allowing funds to be used for lakes and reservoirs as well as rivers and streams. To learn more about this program and what it has accomplished, turn to "Restoring Wild Fish Habitat" on page 15. Rehwinkel is a Habitat Restoration Program Officer stationed in Helena.

Rehwinkel

Lake Elmo State Park is an unusual unit of the state park system for several reasons. First, it is located within the city limits of Billings, Montana's largest city. For another, it doubles as the site of FWP's regional headquarters complex. For a third, it has a long tradition of community involvement—a tradition that remains in full force today. In this issue's "Lands Legacy" installment, **Nancy Hoffer** and **Sue Dalbey** note that many civic groups, organizations, and individuals contribute time and money to the park's maintenance and upkeep. For a close-up look at this unique recreation site, turn to "The People's Park" on page 19. Hoffer is a Billings-based free-lance writer and consultant, and Dalbey, who now lives in Libby, was manager of Lake Elmo State Park from 1991 to 1995.

Although few stream anglers actually *like* them, says **Dave Carty**, dams have their advantages, not the least of which is the improvement in trout habitat where it may not have existed before. In "Tailwater Trout" (p. 23), he points out how cool water released from the depths of upstream reservoirs can provide fish with a rich aquatic food supply, even in midsummer. He also notes that famous tailwater rivers, like the Bighorn, are highly populated with trout *and* anglers, for obvious reasons. He recommends smaller tailwater creeks: "The trout run smaller, although they'll surprise you sometimes, and they lack the sophistication of their educated big brothers. But so what? There's a lot to be said for solitude or fishing with just one good buddy." Carty, an avid angler, is a Bozeman-based free-lance writer.

Most corporations issue an annual report to stockholders that highlights the company's successes and failures over the course of the previous year. FWP is not a corporation, but it too has "stockholders"— the hunters, anglers, and recreationists who support the agency financially as well as through a strong commitment to wildlife conservation. As director Patrick J. Graham says of FWP's progress in 1996: "An array of partnerships with Montana citizens moved us forward." For a summary of FWP's goals, priorities, and projects, turn to the "1996 Annual Report" beginning on page 26.

MO thanks the following artists and photographers for their contributions to this issue: **Robert Bateman**, Salt Spring Island, BC; **Randy Bright**, Lincoln, NE; **Denver Bryan**, **Beth MacConnell**, **Dusan Smetana**, and **Dale C. Spartas**, Bozeman; **Steve Carlisle**, Kelso, WA; **Bill Edelman**, Ronan; **Ron Hedrick**, Davis, CA; **Donald M. Jones**, Troy; **Bill Marchel**, Fort Ripley, MN; **Donnie Sexton**, Helena; **E. Neale Streeks**, Great Falls; and **Al Troth**, Dillon. Thanks also to **Mill Pond Press**, Venice, FL; the **U.S. Fish and Wildlife Service**; and the following employees who work for the department: **Ray Berntsen**, Billings and **Richard E. Mayer**, Helena.

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